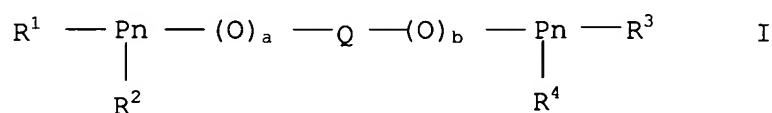


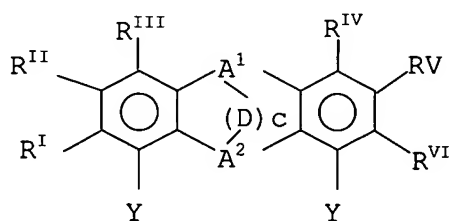
AMENDMENTS TO THE CLAIMS

1. (Original) A process for preparing dialdehydes and/or ethylenically unsaturated monoaldehydes by reacting at least one compound having at least two ethylenically unsaturated double bonds with carbon monoxide and hydrogen in the presence of a hydroformylation catalyst comprising at least one complex of a metal of transition group VIII with at least one ligand selected from among chelating pnictogen compounds of the formula I,



where

Q is a bridging group of the formula



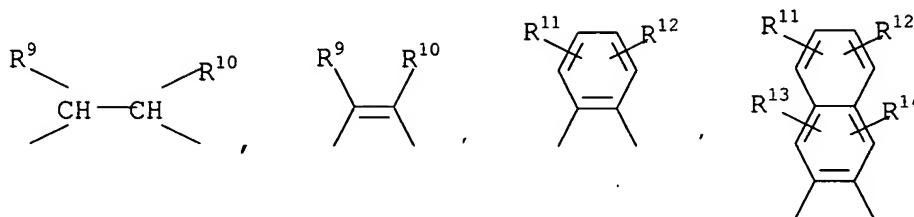
where

A¹ and A² are each, independently of one another, O, S, SiR^aR^b, NR^c or CR^dR^e, where

R^a, R^b and R^c are each, independently of one another, hydrogen, alkyl, cycloalkyl, heterocycloalkyl, aryl or hetaryl,

R^d and R^e are each, independently of one another, hydrogen, alkyl, cycloalkyl, heterocycloalkyl, aryl or hetaryl or the group R^d together with a further group R^d or the group R^e together with a further group R^e form an intramolecular bridging group D,

D is a divalent bridging group selected from among the groups



where

R^9 and R^{10} are each, independently of one another, hydrogen, alkyl, cycloalkyl, aryl, halogen, trifluoromethyl, carboxyl, carboxylate or cyano or are joined to one another to form a C₃-C₄-alkylene bridge,

R^{11} , R^{12} , R^{13} and R^{14} are each, independently of one another, hydrogen, alkyl, cycloalkyl, aryl, halogen, trifluoromethyl, COOH, carboxylate, cyano, alkoxy, SO₃H, sulfonate, NE¹E², alkylene-NE¹E²E³⁺X⁻, acyl or nitro,

c 0 or 1,

Y is a chemical bond,

R^I , R^{II} , R^{III} , R^{IV} , R^V and R^{VI} are each, independently of one another, hydrogen, alkyl, cycloalkyl, heterocycloalkyl, aryl, hetaryl, COOR^f, COO⁻M⁺, SO₃R^f, SO₃⁻M⁺, NE¹E², NE¹E²E³⁺X⁻, alkylene-NE¹E²E³⁺X⁻, OR^f, SR^f, (CHR^gCH₂O)_xR^f, (CH₂N(E¹))_xR^f, (CH₂CH₂N(E¹))_xR^f, halogen, trifluoromethyl, nitro, acyl or cyano,

where

R^f , E¹, E² and E³ are identical or different radicals selected from among hydrogen, alkyl, cycloalkyl and aryl,

R^g is hydrogen, methyl or ethyl,

M⁺ is a cation,

X⁻ is an anion, and

x is an integer from 1 to 120,

or

two adjacent radicals selected from among R^I , R^{II} , R^{III} , R^{IV} , R^V and R^{VI} together with two adjacent carbon atoms of the benzene ring to which they are bound for a fused ring system having 1, 2 or 3 further rings,

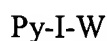
a and b are each, independently of one another, 0 or 1,

Pn is a pnicogen atom selected from among the elements phosphorus, arsenic and antimony,

and

R^1 , R^2 , R^3 , R^4 are each, independently of one another, hetaryl, hetaryloxy, alkyl, alkoxy, aryl, aryloxy, cycloalkyl, cycloalkoxy, heterocycloalkyl, heterocycloalkoxy or an NE^1E^2 group, with the proviso that R^1 and R^3 are pyrrole groups bound via the nitrogen atom to the pnicogen atom Pn

or R^1 together with R^2 and/or R^3 together with R^4 form a divalent group E of the formula



where

Py is a pyrrole group which is bound via the pyrrole nitrogen atom to the pnicogen atom Pn,

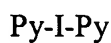
I is a chemical bond or O, S, SiR^aR^b , NR^c , substituted or unsubstituted C_1 - C_{10} -alkylene or CR^hR^i ,

W is cycloalkyl, cycloalkoxy, aryl, aryloxy, hetaryl or hetaryloxy,

and

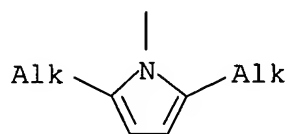
R^h and R^i are each, independently of one another, hydrogen, alkyl, cycloalkyl, heterocycloalkyl, aryl or hetaryl,

or R^1 together with R^2 and/or R^3 together with R^4 form a bispyrrole group of the formula

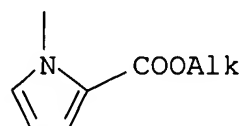


bound via the nitrogen atoms to the pnictogen atom Pn.

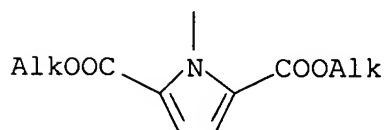
2. (Original) A process as claimed in claim 1, wherein at least one ligand of the formula I, in which the radicals R^1 , R^2 , R^3 and R^4 are selected independently from among groups of the formulae I.a to I.k



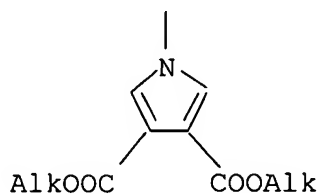
(I.a)



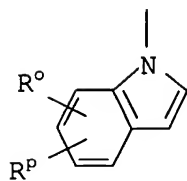
(I.b)



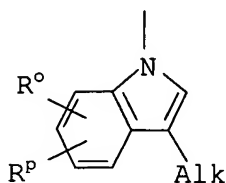
(I.c)



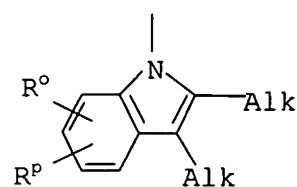
(I.d)



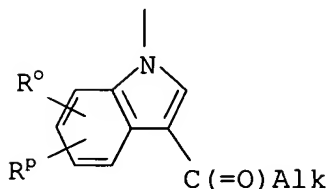
(I.e)



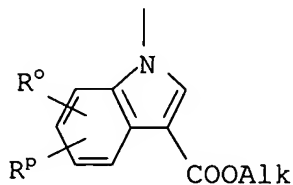
(I.f)



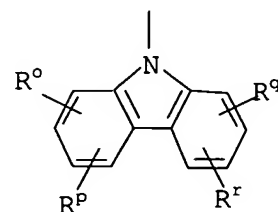
(I.g)



(I.h)



(I.i)



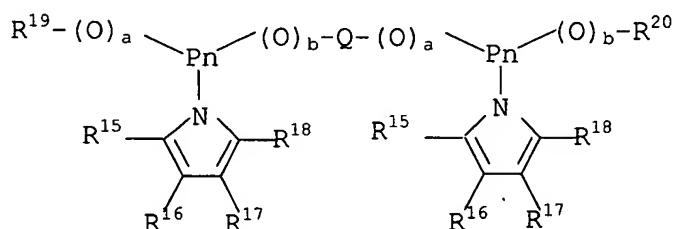
(I.k)

where

Alk is a C₁-C₄-alkyl group and

R^o, R^p, R^q and R^r are each, independently of one another, hydrogen, C₁-C₄-alkyl, C₁-C₄-alkoxy, acyl, halogen, trifluoromethyl, C₁-C₄-alkoxycarbonyl or carboxyl, is used.

3. (Original) A process as claimed in claim 2, wherein at least one ligand of the formula I, in which the radicals R¹, R², R³ and R⁴ are each, independently of one another, a 3-alkylindolyl group, preferably a 3-methylindolyl group, is used.
4. (Currently amended) A process as claimed in claim 1, ~~any of the preceding claims~~, wherein the chelating pnictogen compound of the formula I is selected from among chelating pnictogen compounds of the formula II,



(II)

where

R¹⁵, R¹⁶, R¹⁷ and R¹⁸ are each, independently of one another, hydrogen, alkyl, cycloalkyl, heterocycloalkyl, aryl, hetaryl, W'COOR^k, W'COO⁻M⁺, W'(SO₃)R^k, W'(SO₃)⁻M⁺, W'PO₃(R^k)(R^l), W'(PO₃)₂(M⁺)₂, W'NE⁴E⁵, W'(NE⁴E⁵E⁶)⁺X⁻, W'OR^k, W'SR^k, (CHR¹CH₂O)_yR^k, (CH₂NE⁴)_yR^k, (CH₂CH₂NE⁴)_yR^k, halogen, trifluoromethyl, nitro, acyl or cyano,

where

W' is a single bond, a heteroatom or a divalent bridging group having from 1 to 20 bridge atoms,

R^k, E^4, E^5, E^6 are identical or different radicals selected from among hydrogen, alkyl, cycloalkyl and aryl,

R^1 is hydrogen, methyl or ethyl,

M^+ is a cation equivalent,

X^- is an anion equivalent and

y is an integer from 1 to 240,

where two adjacent radicals R^{15}, R^{16}, R^{17} and R^{18} together with the carbon atoms of the pyrrole ring to which they are bound may also form a fused ring system having 1, 2 or 3 further rings,

with the proviso that at least one of the radicals R^{15}, R^{16}, R^{17} and R^{18} is not hydrogen and R^{19} and R^{20} are not joined to one another,

R^{19} and R^{20} are each, independently of one another, cycloalkyl, heterocycloalkyl, aryl or hetaryl, or R^{19} together with R^{15} or R^{16} and/or R^{19} together with R^{17} or R^{18} form a divalent group

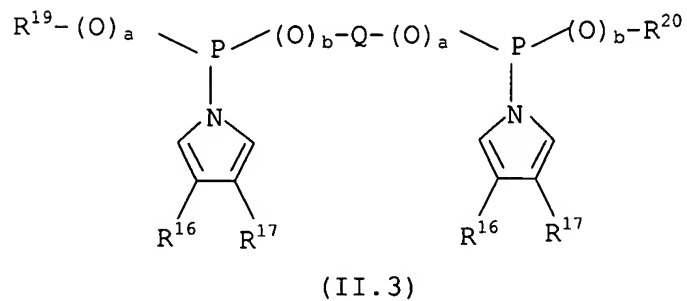
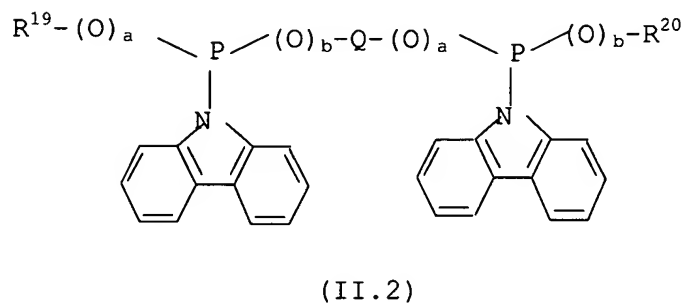
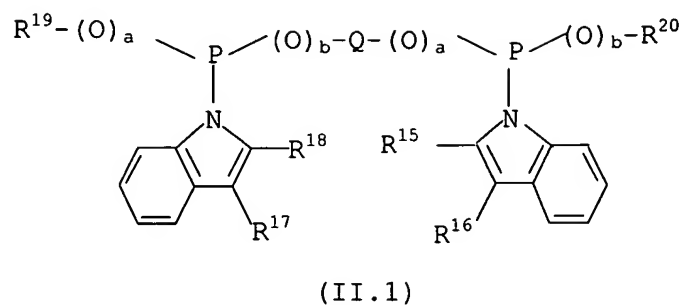
-I-W-

where

I is a chemical bond or O, S, SiR^aR^b , NR^c or substituted or unsubstituted C_1 - C_{10} -alkylene, preferably CR^hR^i , where R^a, R^b, R^c, R^h and R^i are each, independently of one another, hydrogen, alkyl, cycloalkyl, heterocycloalkyl, aryl or hetaryl and

W is cycloalkyl, cycloalkoxy, aryl, aryloxy, hetaryl or hetaryloxy.

5. (Currently amended) A process as claimed in claim 1, ~~any of the preceding claims~~, wherein the chelating pnictogen compound of the formula I is a chelating pnictogen compound of the formulae II.1 to II.3,

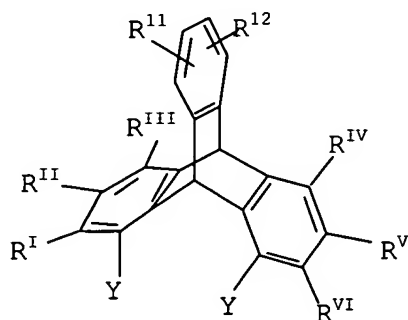


where

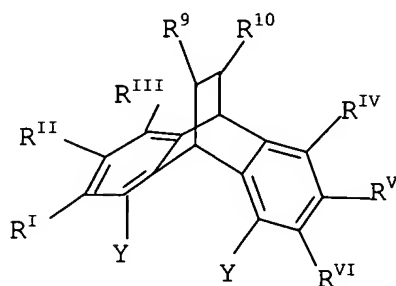
R^{15} , R^{16} , R^{17} , R^{18} , Q , a and b are as defined in claim 4, where at least one of the radicals R^{16} and R^{17} in the formula II.3 is not hydrogen,

R^{19} and R^{20} are each, independently of one another, cycloalkyl, heterocycloalkyl, aryl or hetaryl.

6. (Currently amended) A process as claimed in claim 1, ~~any of claims 1 to 5~~, wherein the bridging group Q is a triptycenediyl group of the formula

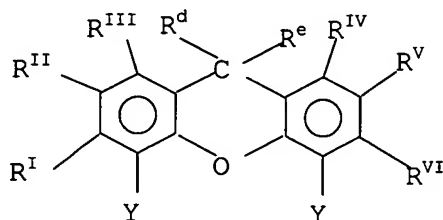


or the formula



where R^I, R^{II}, R^{III}, R^{IV}, R^V and R^{VI}, R⁹, R¹⁰, R¹¹ and R¹² are as defined in claim 1.

7. (Currently amended) A process as claimed in claim 1, ~~any of claims 1 to 5~~, wherein the bridging group Q is a xanthenediyl group of the formula



where R^I, R^{II}, R^{III}, R^{IV}, R^V and R^{VI} and Y are as defined in claim 1 and R^d and R^e are each, independently of one another, hydrogen, alkyl, cycloalkyl, heterocycloalkyl, aryl or hetaryl.

8. (Currently amended) A process as claimed in claim 1, ~~any of the preceding claims~~, wherein a molar ratio of ligand to metal of transition group VIII of from 1:1 to 1000:1 is set in the reaction mixture.
9. (Currently amended) A process as claimed in claim 1, ~~any of the preceding claims~~, wherein the reaction is carried out at from 40 to 80°C.
10. (Currently amended) A process as claimed in claim 1, ~~any of the preceding claims~~, wherein the compound having at least two ethylenically unsaturated double bonds which is used is a α,ω -diolefin.
11. (Currently amended) A process as claimed in claim 1, ~~any of the preceding claims~~, wherein
 - (i) a compound having a least two ethylenically unsaturated double bonds is subjected to the hydroformylation reaction in a reaction zone,
 - (ii) an output is taken from the reaction zone and is fractionated to give a fraction enriched in unsaturated monoaldehydes and a fraction depleted in unsaturated monoaldehydes, and
 - (iii) the fraction depleted in unsaturated monoaldehydes is recirculated, ~~if appropriate~~ optionally after work up, to the reaction zone.